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SPECIFICATION FOR BRUSH, BANISTER (HAND SWEEPING), SINGLE

(*Second Revision*)

(Incorporating Amendment Nos. 1, 2 & 3)

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NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR BRUSH, BANISTER (HAND SWEEPING), SINGLE

(Second Revision)

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Indian Standard

SPECIFICATION FOR BRUSH, BANISTER (HAND SWEEPING), SINGLE

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 26 May 1986, after the draft finalized by the Brushware Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was first published in 1964. It was revised in 1976 wherein use of copper wire was abandoned and non-metric units deleted.

0.3 In this revision, different types of filling materials are being prescribed, namely, mixture of cow-tail hair and natural coco-fibre; only natural coco-fibre; and palmyra fibre. Use of horse-tail hair is abandoned due to scarcity of raw material. In addition, the diameter of staples is increased from 0.8 ± 0.2 mm to 1.2 ± 0.1 mm. Moreover, the total number of holes are being reduced from 90 to 78 to impart greater strength to the board.

0.4 Brushes, banister (hand sweeping), single, are widely used by the Railways, Municipal Corporations, offices, etc, for hand sweeping and road cleaning. These brushes are also finding increasing use among households for cleaning purposes.

0.5 This specification has been drawn up keeping in view the use of this type of brushes for general sweeping purposes. This consideration has led the Sectional Committee to base this specification essentially on specifications Z5-49 'Bristle hair, fibre and cane brushes (other than painters' brushes)' issued by the Ministry of Railways, Government of India; IND/GS/477 : 1948 'Brushes, sweeping, hand', issued by the Ministry of Defence, Government of India; and G/Misc 17A 'Brush, sweeping' by the Directorate General of Supplies and Disposals, Government of India.

0.6 This edition 3.3 incorporates Amendment No. 1 (March 1991), Amendment No 2 (February 2004) and Amendment No 3 (September 2004). Side bar indicates modification of the text as the result of incorporation of the amendments.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for brush, banister (hand sweeping), single.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 5060-1969† and IS : 707-1976‡ and the following shall apply.

2.1.1 *Approved Tender Sample* — The sample accepted by the indentor or inspection authority as the basis for supply. When a sample is tested and approved by the purchaser or an inspection authority, the results of such tests as will permit the supplier to meet the limits imposed by the specification for deliveries shall be made available to the supplier.

3. REQUIREMENTS

3.1 Materials

3.1.1 *Filling Material* — There shall be the following three types of filling material:

a) *Type* 1 shall consist of equal proportions of coco fibre and nylon bristles of diameter 0.35 mm,

b) *Type 2* shall consist of only natural coco-fibre, and

c) *Type* 3 shall consist of natural palmyra fibre.

In all cases the filling material shall conform to the approved tender sample.

3.1.1.1 *Cow-tail hair* — It shall be clean, free from dust and other extraneous matter and shall conform to the approved tender sample.

3.1.1.2 *Coco-fibre* — Selected, reasonably straight and thoroughly cleaned coco-fibre of natural colour shall be used. The fibres shall be similar in quality and solidity to the approved tender sample.

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*Rules for rounding off numerical values (*revised*).

†Glossary of terms used in brushware industry.

‡Glossary of terms applicable to timber technology and utilization (*second revision*).

3.1.1.3 *Palmyra fibre* — Selected, reasonably straight and thoroughly cleaned palmyra fibre of natural colour shall be used. The fibres shall be similar in quality and solidity to the approved tender sample.

3.1.2 ***Timber***

3.1.2.1 Any of the timber species listed in Appendix A shall be used for the manufacture of the wooden portion (*see* Fig. 1) of the brush.

3.1.2.2 The timber shall be reasonably straight-grained, and well-seasoned to a moisture content not exceeding 15 percent when tested on electronic moisture meter or, in case of dispute, by oven-dry method (*see* Appendix B).

3.1.2.3 The timber shall be free from brashness, any kind of biological or non-biological deterioration, insect attack, centre heart (pith), knots (except live pin knots), cracks, warp and any other defect which may reduce the life of the brush or affect its utility.

3.1.2.4 The grains of the timber, specially of the one used for the base plate, should be sealed by varnish or some sort of knotting solution before fixing up the tufts of filling material in order to preserve the timber from any sort of future decay.

3.1.3 *Nails*— Seven securing nails of steel, having nominal length and diameter of 19 and 1.40 mm respectively, shall be used.

3.1.4 *Wire* — For fastening the tufts of filling material in the case of wire-drawn brushes, GI wire of 0.45 ± 0.05 mm diameter shall be used.

3.1.5 *Staples* — In the case of staple set brushes, bright iron wire of diameter 1.2 ± 0.1 mm shall be used.

3.1.6 *Animal Glue* — Animal glue conforming to IS : 852-1969* shall be used.

3.2 Manufacture

3.2.1 The brush shall generally conform to the shape and design shown in Fig. 1.

3.2.2 The board and the top plate shall be manufactured from single pieces of timber.

3.2.3 The board shall be drilled with seventy eight 6/3-mm diameter stepped tuft holes as shown in Fig. 1.

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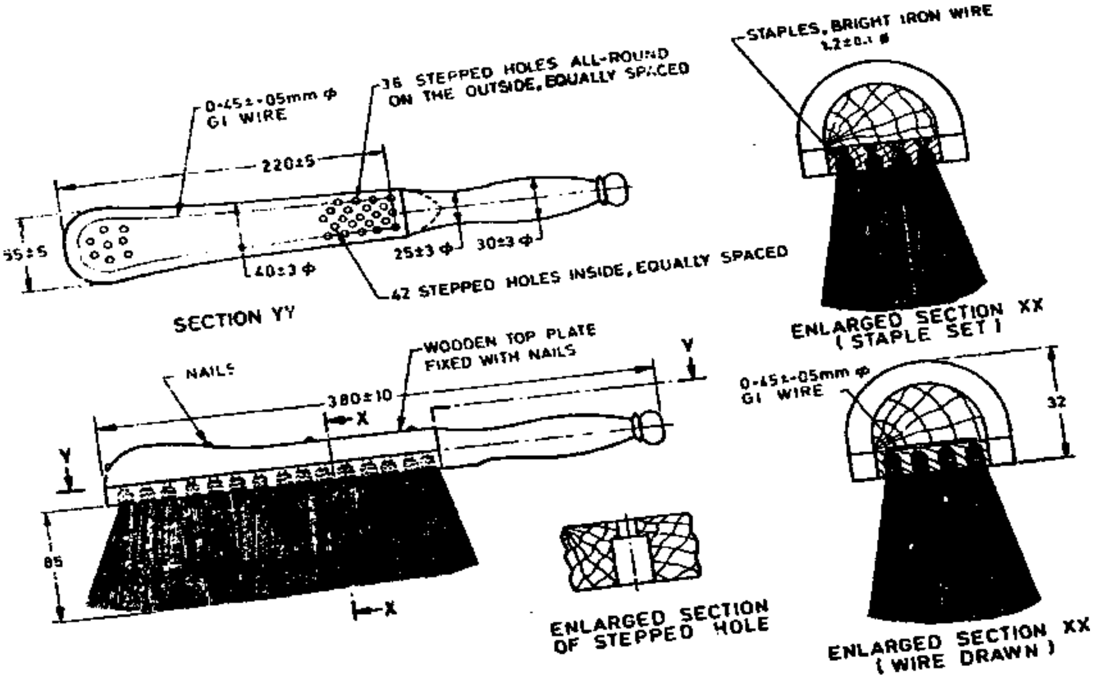
*Specification for animal glue for general wood-working purposes (*first revision*).



All dimensions in millimetres.

FIG.1 BRUSH, BANISTER (HAND SWEEPING). SINGLE

3.2.4 *For Wire-Drawn Brushes* — The tufts of filling material shall be firmly drawn into the tuft holes by means of galvanized iron wire and thoroughly bottomed so that they cannot be subsequently knocked back. The top plate shall be securely glued to the board and reinforced by seven nails as shown in Fig. 1 in such a manner that they do not foul the wire or the filling material.

3.2.4.1 The filling material shall be trimmed straight-faced to give the shape as shown in Fig. 1.

3.2.5 *For Staple-Set Brushes* — No top plate is required. The tufts of the filling material shall be cross-stapled and anchored to the bottom of the tuft holes by machine, to give the shape of the brush as shown in Fig. 1.

3.3 Dimensions and Tolerances — The dimensions and tolerances shall be as given in Fig. 1.

3.3.1 A tolerance of 0.5 mm may be allowed on the diameter of the tuft holes.

3.4 Workmanship and Finish

3.4.1 The wooden portion shall be finished smooth and suitably polished or painted.

3.4.2 In general workmanship and finish, the brushes shall match the approved tender sample.

3.5 Tests

3.5.1 *Pull Test* — The tuft of the filling material shall not come out when subjected to straight pull with thumb and finger grip.

3.5.2 ***Mass of Filling Material per Finished Brush*** — **Separate the** wooden back block after removal of nails/screws. Unfasten tufts by removal of fastening wire or staples and pull out the filling material. Dry in an oven at 100 ± 2°C. Cool, segregate (in case of Type 1) and weigh under prevalent atmospheric conditions and thus determine the individual mass of the different types of the filling materials in the mixture.

3.5.2.1 The total mass of the filling material in a brush shall be a minimum of 138 g for all the types. However, for Type 1 brushes, at least 6.9 g of filling material shall be cow-tail hair (*see* Appendix C). A tolerance of ± 5 percent may be allowed on the individual brushes provided the average mass of the filling material per brush is maintained at 160 g minimum. The average mass of the filling material per brush in a lot shall be assessed by taking the average of 3 for a lot of not more than 300 brushes and of 6 for a lot of more than 300 brushes. The percentages of cow-tail hair and coco-fibre should be assessed by taking the mass of each separately after proper segregation as prescribed in Appendix C.

3.5.3 The cow-tail hair shall satisfy the burn test as specified in **8.1** of IS : 1844-1975[*].

4. MARKING

4.1 Unless otherwise agreed to between the indentor or inspection authority and the supplier, each brush shall be legibly and indelibly marked or stamped with the following:

a) Manufacturer's name and trade-mark, if any; and

b) Year of manufacture.

4.1.1 The brushes may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4.2 In addition to the marking specified in **4.1**, each brush shall show suitably on its wooden portion the particulars, namely, percentage and type of the filling materials used.

5. PRESERVATION

5.1 The filling material of the brushes shall be liberally dusted with a mixture of 5 parts by mass of Lindane 6.5% DP (*see* IS : 14834-2000[†]) or methyl parathion 2% DP (*see* IS : 564-1984[*]) and 95 parts by mass of French chalk (*see* IS: 380-1978[§]). Alternatively, pieces of naphthalene balls (*see* 539-1974[¶]) shall be used in the packing container for the brushes.

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[*] Specification for bristles (*first revision*).

[†] Lindane dusting powder — Specification.

[‡] Specification for methyl parathion dusting powders.

[§] Specificatlon for French chalk, technical (*second revision*).

[¶] Specification for naphthalene (*second revision*).

6. PACKING

6.1 The brushes shall be despatched according to the agreement between the indentor and the supplier, taking precautionary measures against deformity and any type of damage that may occur to the brush in transit.

7. TENDER SAMPLES AND SAMPLING

7.1 The supplier/manufacturer is required to submit three identical brushes for approval, provided the indent is for more than 25 brushes, keeping in view that identically similar brushes shall have to be supplied in case the same is approved by the indentor.

7.1.1 The indentor or inspection authority shall retain one of the three approved tender samples.

7.2 Representative samples for test shall be drawn as prescribed in Appendix D.

8. SHELF LIFE

8.1 The brushes shall have a shelf-life of one year from the date of manufacture, provided, proper storage conditions are used and adequate precautions are taken for preserving them as given under 4 of IS:3451 (Part 2)-1975*.

APPENDIX A

(*Clause* 3.1.2.1)

SPECIES OF TIMBER FOR MANUFACTURE OF WOODEN PORTION OF BRUSH

A-1. The list of species of timber approved for the manufacture of wooden portion of banister brushes is given below:

TRADE NAME		BOTANICAL NAME
Roman	***Devanagari***	
Aini	**ऐनी**	***Artocarpus hirsuta*** **Lamk., fam. Moraceae**
Banati	**बनाती**	***Lophopetalum wightianum*** **Arn., fam. Celastraceae**

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*Code of practice for care and maintenance of brushes: Part 2 Brushes other than pan-set brushes.

TRADE NAME		BOTANICAL NAME
Roman	*Devanagari*	
Bijasal	बीजसाल	*Pterocarpus marsupium* Roxb., fam. Leguminosae
Champak	चम्पक	*Michelia champaca* Linn., fam. Mangoliaceae
Chickrassi	चिकरासी	*Chukrasia tabularis* A. Juss., fam. Maliaceae
Dhaman	धामन	*Grewia tiliifolia* Vahl., fam. Tiliaceae
Gamari (gumhar)	गमारी (गुम्हार)	*Gmelina arborea* Roxb., fam. Verbenaceae
Haldu	हल्दु	*Adina cordifolia* Hook, f., fam. Rubiaceae
Kaim	कैम	*Mitragyna parvifolia* Roxb., Korth., syn. *Stephegyne parvifolia* Korth., fam. Rubiaceae
Kanju	कांजू	*Holoptelea integrifolia* Planch., fam. Ulmaceae
Kathal	कटहल	*Artocarpus heterophyllus* Lamk. syn. *A. integrifolia* Linn., fam. Moraceae
Kuthan	कूथन	*Hymenodictyon excelsum* Wall., fam. Rubiaceae
Lambapatti	लम्बापत्ती	*Planchonella longipetiolatum* H. J. Lam., syn. *Sideroxylon longipetiolatum* King & Prain, fam. Sapotaceae
Aam (mango)	आम	*Mangifera indica* Linn., fam. Anacardiaceae
Nim-chameli	नीम-चमेली	*Millingtonia hortensis* Linn., f., fam. Bignoniaceae
Kodapalai choupaini (piney)	कोडपलई (चौपेनी) (पिनी)	*Kingiodendron pinnatum* Harms. syn. *Hardwickia pinnata* Roxb., fam. Leguminosae
Toon	तून	*Toona ciliata* Roem., syn. *Cedrela toona* Roxb., fam. Maliaceae

APPENDIX B

(*Clause* 3.1.2.2)

DETERMINATION OF MOISTURE CONTENT OF TIMBER

B-1. TEST SPECIMEN

B-1.1 The entire block used in a brush or a coupon cut from it may form the test specimen for determination of moisture content. When for any reason additional determination of moisture content is required, separate specimens shall be prepared from the same sample material. Smaller specimens may be used when deemed necessary. The test shall be carried out immediately after cutting the specimen.

B-2. PROCEDURE

B-2.1 Weigh accurately each test specimen. Dry in a ventilated oven at a temperature of 105° ± 2°C until the mass becomes constant between two successive weighings made at an interval of not less than one hour.

B-3. CALCULATION

B-3.1 The moisture content, expressed as a percentage of the oven-dry mass, is given by the following formula:

$$\text{Moisture content} = \frac{M_1 - M_0}{M_0} \times 100$$

where

M_1 = initial mass in g of the test specimen, and
M_0 = oven-dry mass in g of the test specimen.

APPENDIX C

(*Clause* 3.5.2.1)

METHOD FOR DETERMINING PROPORTION OF COW-TAIL HAIR AND COCO-FIBRE

C-1. APPARATUS

C-1.1 Glass Beaker — 1 000 ml capacity.

C-1.2 Glass Measuring Cylinder — 500 ml.

C 2. REAGENTS

C-2.1 Sodium Hydroxide Solution — 5 percent (*m/v*).

C-2.2 Acetic Acid Solution — 2 percent (*m/v*).

C-3. PROCEDURE

C-3.1 Take at random a few complete tufts of filling material from the brush. Cut them about 25 mm in length and condition at 27 ± 2°C and 65 ± 5 percent relative humidity for 24 hours. Weigh 4 to 5 g (M_1) of material and take in a beaker. Add 500 ml of sodium hydroxide solution into the beaker and dip the fibres completely into the solution by means of a glass rod. Heat the mixture on a small flame till the solution boils uniformly and briskly.

C-3.2 Continue boiling for 15 minutes with occasional stirring taking care that during boiling all the fibres are uniformly acted upon by the solution. Dilute the solution with distilled water to about 1 000 ml. Filter the solution through a Buchner funnel fitted with *malmal* cloth keeping bulk of the fibre in the beaker. Wash all the fibres 6 to 8 times with distilled water and filter through the Buchner funnel till it becomes almost free from alkali. Then wash the fibres with acetic acid solution for neutralizing the traces of alkali and until they assume a pale yellow colour. Finally wash again 2 to 3 times with distilled water. Collect all the fibres and dry them to constant mass in an air-oven at 100 ± 2°C. Take out from the oven and condition for 24 hours at 27 ± 2°C and 65 ± 5 percent relative humidity and then take the final mass (M_2) of the extracted fibres.

C-4. CALCULATION

C-4.1 Coco-fibre, percent by mass = $\frac{M_2 \times K \times 100}{M_1}$

where

M_2 = mass of extracted fibres,

K = 1.26 correction factor for loss of lignin of coco-fibre in alkali, and

M_1 = mass of filling material taken for test.

C-4.2 The percent by mass content of cow-tail hair shall be 100 minus coco-fibre content, percent by mass.

C-5. REPORT

C-5.1 Report the mean value of five determinations as the ratio of percent of coco-fibre and cow-tail hair.

APPENDIX D

(*Clause* 7.2)

SAMPLING AND CRITERIA FOR CONFORMITY

D 1. SCALE OF SAMPLING

D-1.1 Lot — In any consignment, all the brushes of the same size and quality shall be divided into groups of 500 brushes or less and each such group shall constitute a lot. Care shall be taken to ensure that brushes included in a lot do not differ in construction as far as possible.

D-1.2 The conformity of the brushes in a lot to the requirements of this specification shall be ascertained for each lot separately. The number of brushes to be selected for this purpose shall be in accordance with Table 1.

TABLE 1 SCALE OF SAMPLING

[*Clauses* D-1.2 *and* D-1.3 (b)]

NO. OF BRUSHES IN THE LOT *N* (1)	No. OF BRUSHES TO BE SELECTED *n* (2)
Up to 10	2
11 „ 25	3
26 „ 50	4
51 „ 100	5
101 ., 150	6
151 „ 300	7
301 „ 500	8

D-1.3 The brushes shall be selected at random. To ensure randomness of selection one of the following procedures, whichever is suitable, may be followed:

a) If all the brushes in a lot are packed in one box, then starting from any brush, count them in any suitable order as 1, 2.........,up to *r* and so on, where *r* is the integral part of *N*/*n* (*N* and *n* being the lot size and sample size, respectively), Every *r*th brush thus counted shall be withdrawn to constitute the sample.

b) If the brushes in a lot are packed in more than one box, approximately equal number of brushes shall be picked up at random from as many boxes as possible so as to obtain the required number of brushes as specified in Table **1.**

D-2. CRITERIA FOR CONFORMITY

D-2.1 For declaring the conformity of the lot to the requirements of this specification, all the brushes selected according to **D-1.2** and **D-1.3** shall satisfy the relevant requirements given in 3.

NOTE — For description of filling materials (*see* **3.1.1, 3.1.1.1** and **3.1.1.2**) and workmanship and finish (*see* **3.4**), the brushes selected shall be matched with the approved tender sample, and shall be suitably stamped and sealed by the indentor or the inspection authority and the supplier and kept at a place agreed to between the two.

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